

IN THE CLAIMS

The following listing of the claims is provided in accordance with 37 C.F.R. §1.121.

1. (original) A method for determining the motion of an organ, comprising the steps of:
 - acquiring a first set of one-dimensional motion data for an organ along a first axis by a first methodology;
 - acquiring a second set of one-dimensional motion data for the organ along a second axis by a second methodology, wherein the first axis and the second axis are perpendicular;
 - acquiring a third set of one-dimensional motion data for the organ along a third axis by a third methodology, wherein the third axis is perpendicular to the first axis and the second axis;
 - deriving one or more concurrent motion vectors from each of the first, second, and third sets of one-dimensional motion data; and
 - combining the one or more concurrent motion vectors to generate a set of three-dimensional motion data for the organ.
2. (original) The method as recited in claim 1, wherein:
 - acquiring at least one set of one-dimensional motion data comprises measuring the motion along the one or more respective axes with a set of one or more sensors.
3. (previously presented) The method as recited in claim 1, wherein:
 - acquiring at least one of the first, second, or third set of one-dimensional motion data comprises validating the one or more sets of one-dimensional motion data using one or more respective sets of validation motion data.

4. (original) The method as recited in claim 1, wherein acquiring at least one set of one-dimensional motion data comprises determining the motion along the one or more respective axes from a respective set of motion data derived from an imager.

5. (previously presented) The method as recited in claim 4, wherein the respective set of motion data is derived from a set of acquisition image data or pre-acquisition image data.

6. (canceled)

7. (previously presented) The method as recited in claim 5, wherein the set of acquisition image data comprises a set of unreconstructed image data or a set of reconstructed image data.

8. (canceled)

9. (previously presented) The method as recited in claim 1, wherein two of the first methodology, the second methodology or the third methodology comprise the same methodology.

10. (previously presented) The method as recited in claim 1, wherein at least one of the first methodology, the second methodology or the third methodology comprises a sensor-based methodology, and wherein at least one of the first methodology, the second methodology or the third methodology comprises an image-based methodology.

11. (previously presented) The method as recited in claim 1, wherein the first methodology, the second methodology or the third methodology comprise one or more data-based methodologies, wherein the one or more data-based methodologies determine motion from one or more respective sets of acquisition image data.

12. (original) The method as recited in claim 11, wherein the one or more respective sets of acquisition image data comprise one or more sets of unreconstructed image data.

13. (original) The method as recited in claim 11, wherein the one or more respective sets of acquisition image data comprise one or more sets of reconstructed image data.

14. (previously presented) A computer readable storage medium having executable code stored thereon, the executable code comprising:

a routine for acquiring a first set of one-dimensional motion data for an organ along a first axis by a first methodology;

a routine for acquiring a second set of one-dimensional motion data for the organ along a second axis by a second methodology, wherein the first axis and the second axis are perpendicular;

a routine for acquiring a third set of one-dimensional motion data for the organ along a third axis by a third methodology, wherein the third axis is perpendicular to the first axis and the second axis;

a routine for deriving one or more concurrent motion vectors from each of the first, second, and third sets of one-dimensional motion data; and

a routine for combining the one or more concurrent motion vectors to generate a set of three-dimensional motion data for the organ.

15. (previously presented) The computer readable storage medium, as recited in claim 14, wherein:

at least one routine for acquiring at least one of the first, second, or third set of one-dimensional motion data acquires the one-dimensional motion data along the one or more respective axes from a set of one or more sensors.

16. (previously presented) The computer readable storage medium as recited in claim 14, wherein:

at least one routine for acquiring at least one of the first, second, or third set of one-dimensional motion data validates the one or more sets of one-dimensional motion data using one or more respective sets of validation motion data.

17. (previously presented) The computer readable storage medium as recited in claim 14, wherein:

at least one routine for acquiring at least one of the first, second, or third set of one-dimensional motion data determines the one-dimensional motion along the one or more respective axes from a respective set of motion data derived from an imager.

18. (previously presented) The computer readable storage medium, as recited in claim 17, wherein the respective set of motion data is derived from a set of acquisition image data or a set of pre-acquisition image data.

19. (canceled)

20. (previously presented) The computer readable storage medium, as recited in claim 18, wherein the set of acquisition image data comprises a set of unreconstructed image data or a set of reconstructed image data.

21. (canceled)
22. (previously presented) The computer readable storage medium, as recited in claim 14, wherein two of the first methodology, the second methodology or the third methodology comprise the same methodology.
23. (previously presented) The computer readable storage medium, as recited in claim 14, wherein at least one of the first methodology, the second methodology or the third methodology comprises a sensor-based methodology, and wherein at least one of the first methodology, the second methodology or the third methodology comprises an image-based methodology.
24. (previously presented) The computer readable storage medium, as recited in claim 14, wherein the first methodology, the second methodology or the third methodology comprise one or more data-based methodologies, wherein the one or more data-based methodologies determine motion from one or more respective sets of acquisition image data.
25. (previously presented) The computer readable storage medium, as recited in claim 24, wherein the one or more respective sets of acquisition image data comprise one or more sets of unreconstructed image data.
26. (previously presented) The computer readable storage medium, as recited in claim 24, wherein the one or more respective sets of acquisition image data comprise one or more sets of reconstructed image data.

27. (previously presented) An imaging system, comprising,
an imager configured to generate a plurality of signals representative of one or more structures within a region of interest;
a sensor-based motion determination system configured to acquire one-dimensional motion data from one or more sensors;
data acquisition circuitry configured to acquire the plurality of signals;
data processing circuitry configured to process the plurality of signals;
system control circuitry configured to operate at least one of the imager or the data acquisition circuitry; and
an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;
wherein the imager, the sensor-based motion determination system, or a combination of the imager and the sensor-based motion determination system is configured to acquire a first, a second, and a third set of one-dimensional motion data for an organ along respective first, second, and third perpendicular axes; and
wherein at least one of the sensor-based motion determination system, the data processing circuitry, or the operator workstation are configured to derive one or more concurrent motion vectors from each of the first, second, and third sets of one-dimensional motion data and to combine the one or more concurrent motion vectors to generate a set of three-dimensional motion data for the organ.

28. (previously presented) The imaging system, as recited in claim 27, wherein at least one of the sensor-based motion determination system, the data processing circuitry, or the operator workstation is configured to validate one or more sets of one-dimensional motion data using one or more respective sets of validation motion data.

29. (previously presented) The imaging system, as recited in claim 27, wherein the one or more sensors comprise at least one of an accelerometer, an optical marker, a displacement sensor, a force sensor, an ultrasonic sensors, a strain gauge, a photodiode, or a pressure sensor.

30. (previously presented) The imaging system, as recited in claim 27, wherein at least one of the first, the second, or the third set of one-dimensional motion data is determined from a respective set of motion data acquired by the imager.

31. (previously presented) The imaging system, as recited in claim 30, wherein the respective set of motion data is a set of pre-acquisition image data or a set of acquisition image data.

32. (canceled)

33. (previously presented) The imaging system, as recited in claim 31, wherein the set of acquisition image data comprises a set of unreconstructed image data - or a set of reconstructed image data.

34. (canceled)

35. (original) The imaging system, as recited in claim 27, wherein the first and second sets of one-dimensional motion data are acquired by the sensor-based motion determination system.

36. (canceled)

37. (original) The imaging system, as recited in claim 27, wherein the first, second, and third sets of one-dimensional motion data are acquired by the sensor-based motion determination system.

38. (previously presented) An imaging system, comprising,
an imager configured to generate a plurality of signals representative of one or more structures within a region of interest and to acquire at least one set of acquisition image data used to derive a first, a second, and/or a third set of one-dimensional motion data for an organ along respective first, second, and third perpendicular axes;
data acquisition circuitry configured to acquire the plurality of signals;
data processing circuitry configured to process the plurality of signals;
system control circuitry configured to operate at least one of the imager or the data acquisition circuitry; and
an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry; and
wherein at least one of the data processing circuitry or the operator workstation is configured to derive one or more concurrent motion vectors from each of the first, second, and third sets of one-dimensional motion data and to combine the one or more concurrent motion vectors to generate a set of three-dimensional motion data for the organ.

39. (original) The imaging system, as recited in claim 38, wherein the at least one set of acquisition data comprises one or more sets of unreconstructed image data.

40. (original) The imaging system, as recited in claim 38, wherein the at least one set of acquisition data comprises one or more sets of reconstructed image data.

41. (previously presented) The imaging system, as recited in claim 38, wherein at least one of the data processing circuitry or the operator workstation is configured to validate one or more sets of one-dimensional motion data using one or more respective sets of validation motion data.

42. (canceled)

43. (previously presented) The method as recited in claim 1, wherein at least one of the first, second, or third sets of one-dimensional motion data comprises measured mechanical motion data for the organ.

44. (previously presented) The method as recited in claim 2, wherein the one or more sensors are affixed to a subject of interest.

45. (previously presented) The computer readable storage medium, as recited in claim 14, wherein at least one of the first, second, or third sets of one-dimensional motion data comprises measured mechanical motion data for the organ.

46. (previously presented) The computer readable storage medium, as recited in claim 15, wherein the one or more sensors are affixed to a subject of interest.

47. (previously presented) The imaging system, as recited in claim 27, wherein at least one of the first, second, or third sets of one-dimensional motion data is acquired by the imager, and wherein at least one of the first, second, or third sets of one-dimensional motion data is acquired by the sensor-based motion determination system.

48. (previously presented) The imaging system, as recited in claim 27, wherein the one or more sensors are affixed to a subject of interest such that the one or more sensors is stationary with respect to the subject of interest.

49. (previously presented) The imaging system, as recited in claim 27, wherein at least one of the first, second, or third sets of one-dimensional motion data comprises measured mechanical motion data for the organ.

50. (previously presented) An imaging system, comprising,
an imager configured to generate a plurality of signals representative of one or more structures within a region of interest of a patient;

a sensor-based motion determination system configured to acquire one-dimensional motion data from one or more sensors, wherein at least one of the one or more sensors comprises a pad configured to affix the sensor to a body surface of the patient;

data acquisition circuitry configured to acquire the plurality of signals;
data processing circuitry configured to process the plurality of signals;
system control circuitry configured to operate at least one of the imager or the data acquisition circuitry; and

an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;

wherein the imager, the sensor-based motion determination system, or a combination of the imager and the sensor-based motion determination system is configured to acquire a first, a second, and a third set of one-dimensional motion data for an organ along respective first, second, and third perpendicular axes;

wherein at least one of the sensor-based motion determination system, the data processing circuitry, or the operator workstation are configured to derive one or more concurrent motion vectors from each of the first, second, and third sets of one-dimensional motion data and to combine the one or more concurrent motion vectors to generate a set of three-dimensional motion data for the organ; and

wherein the one or more sensors are configured to remain generally stationary with respect to the position of the patient during the acquisition of the first, second, and third sets of one dimensional motion data.